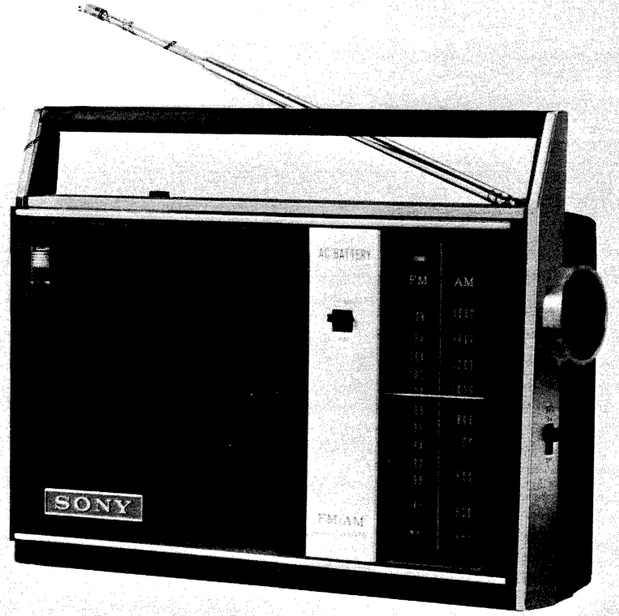
6F-21WA

6F-21WA



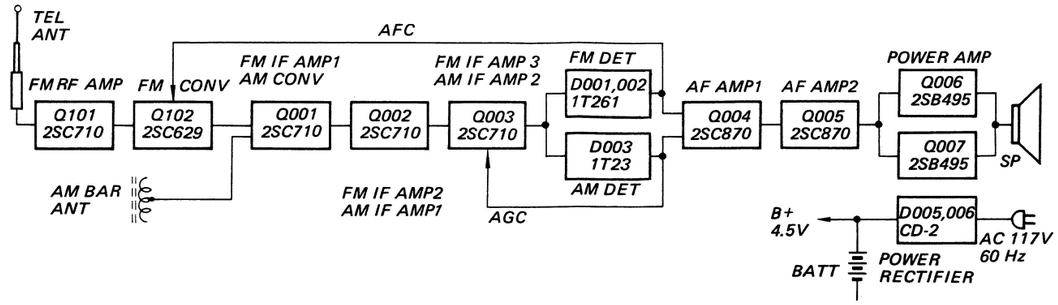
SPECIFICATIONS

Circuit System:	9-transistor 9-diode superheterodyne
Frequency Coverage:	FM 87 ~ 108 MHz (3.44 ~ 2.78 m) AM 530 ~ 1,605 k Hz (566 ~ 187 m)
Intermediate Frequency:	FM 10.7 MHz AM 455 k Hz
Antenna System:	FM built-in telescopic antenna AM built-in ferrite bar antenna
Power Requirements:	Three "D" size flashlight batteries, 4.5 V in total or house current ac 117 V
Power Output:	500 mW (undistorted) 800 mW (maximum)
Current Drain:	FM 18 mA, AM 15 mA at zero signal 190 mA at 500 mW output
Maximum Sensitivity: (at 50 mW output)	FM 1.2 μV AM 40 μV/m
Selectivity:	22 dB, 10 kHz off resonance at 1,400 kHz
MPX OUT jack:	Impedance 5 kΩ Level 44 mV
AUX IN jack:	Impedance 5 kΩ Level 44 mV
Record-Out jack:	Impedance 1 kΩ Level 1.4 mV
Speaker:	3 5/8″ (92 mm), 8 Ω
Dimensions:	8 9/16″ (W) x 5 1/4″ (H) x 2 5/16″ (D) (218 mm x 133 mm x 59 mm)
Weight:	2 1b 10 oz (1.2 kg)

SONY

SERVICE MANUAL

BLOCK DIAGRAM



EXTERNAL VIEW

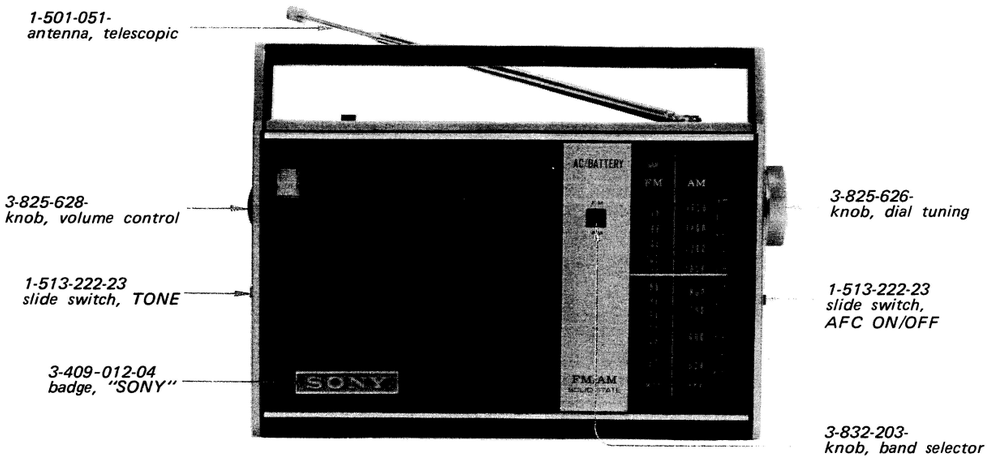


Fig. 1 External view

INTERIOR VIEW

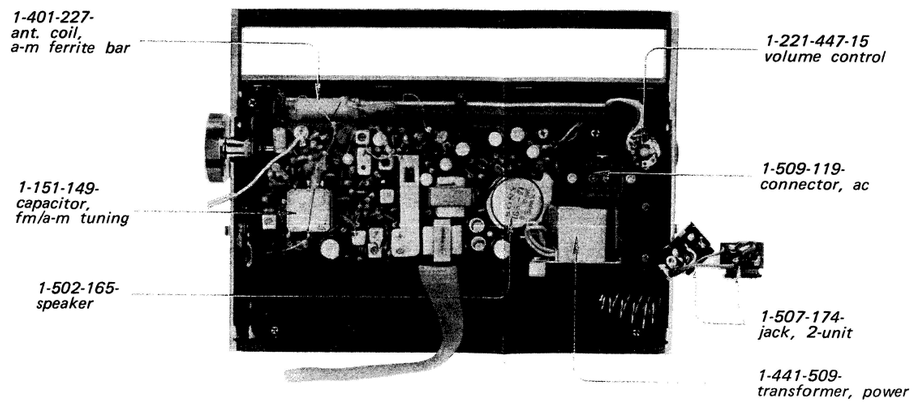
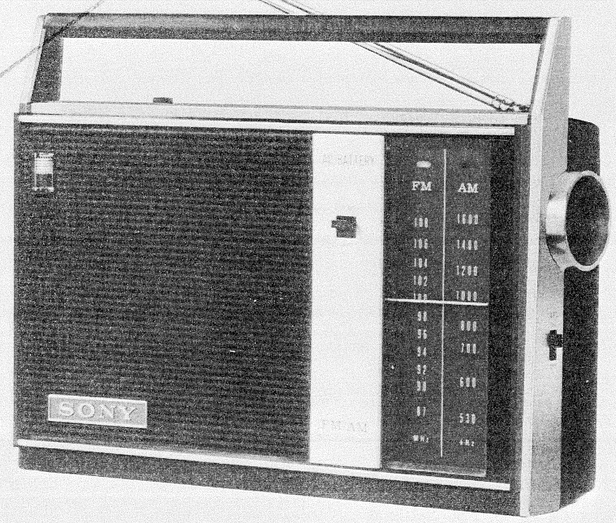


Fig. 2 Interior view

1776

6F-21WA

ARCHIVEXEMPLAR



SPECIFICATIONS

Circuit System:	9-transistor 9-diode superheterodyne
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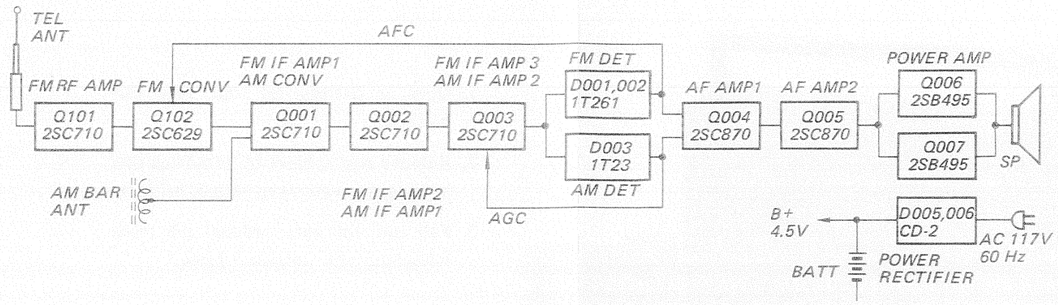
Power Requirements:	Three "D" size flashlight batteries, 4.5 V in total or house current ac 117 V
Power Output:	500 mW (undistorted) 800 mW (maximum)
Current Drain:	FM 18 mA, AM 15 mA at zero signal 190 mA at 500 mW output
Maximum Sensitivity: (at 50 mW output)	FM 1.2 μV AM 40 μV/m
Selectivity:	22 dB, 10 kHz off resonance at 1,400 kHz
MPX OUT jack:	Impedance 5 kΩ Level 44 mV
AUX IN jack:	Impedance 5 kΩ Level 44 mV
Record-Out jack:	Impedance 1 kΩ Level 1.4 mV
Speaker:	3 5/8″ (92 mm), 8 Ω
Dimensions:	8 9/16″ (W) x 5 1/4″ (H) x 2 5/16″ (D) (218 mm x 133 mm x 59 mm)
Weight:	2 lb 10 oz (1.2 kg)

1776

SONY®

SERVICE MANUAL

BLOCK DIAGRAM



EXTERNAL VIEW

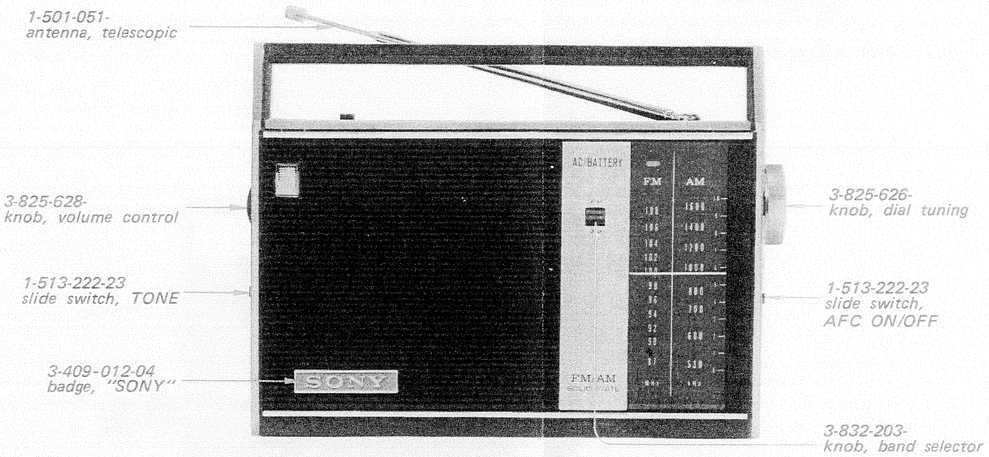


Fig. 1 External view

INTERIOR VIEW

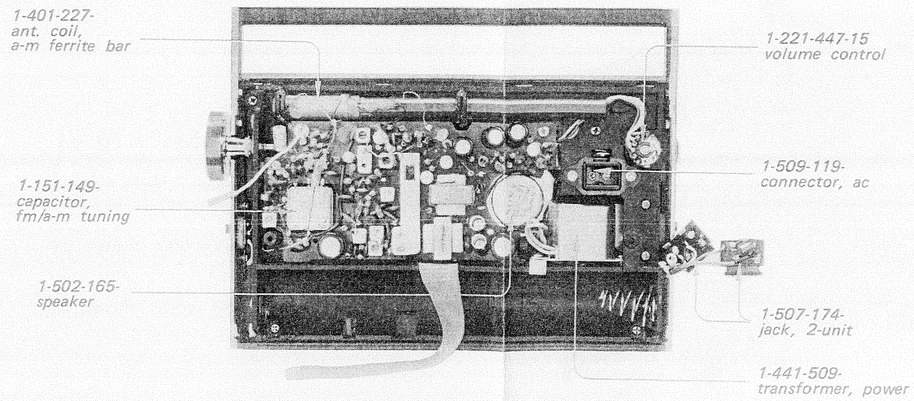
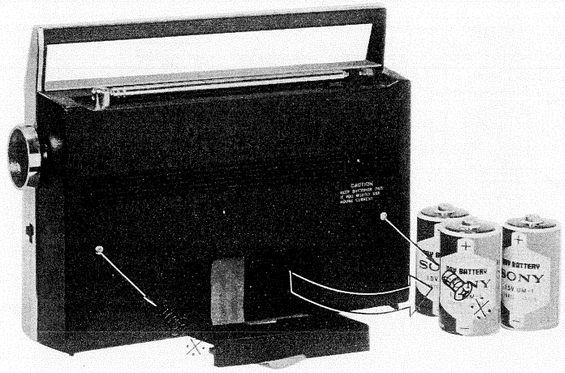


Fig. 2 Interior view

REAR CABINET REMOVAL



1. Open a battery lid and take out batteries.
2. Remove rear cabinet by removing two holding screws marked with ※ in Fig. 3.
3. Pull out the ant. terminal pin from telescopic ant. terminal piece.

Fig. 3 Rear cabinet removal

CHASSIS REMOVAL

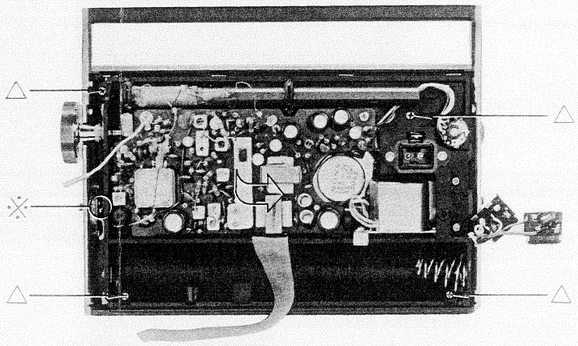


Fig. 4-1 Chassis removal

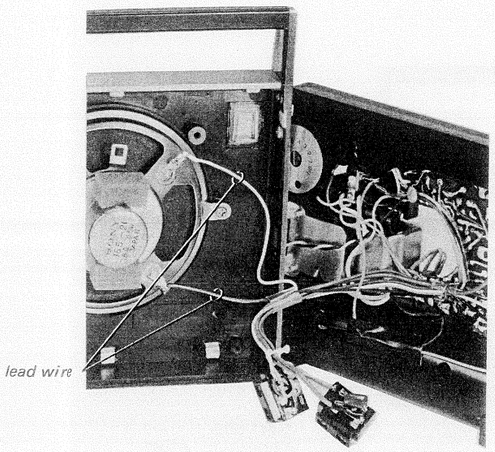


Fig. 4-2 Chassis removal

1. Remove four screws marked with △ in Fig. 4-1.
2. Unsolder two TONE switch lead wires marked with ※ in Fig. 4-1.
3. Remove chassis in the direction shown by the arrow.
4. Unsolder two speaker lead wires shown in Fig. 4-2.

PRINTED CIRCUIT BOARD REMOVAL

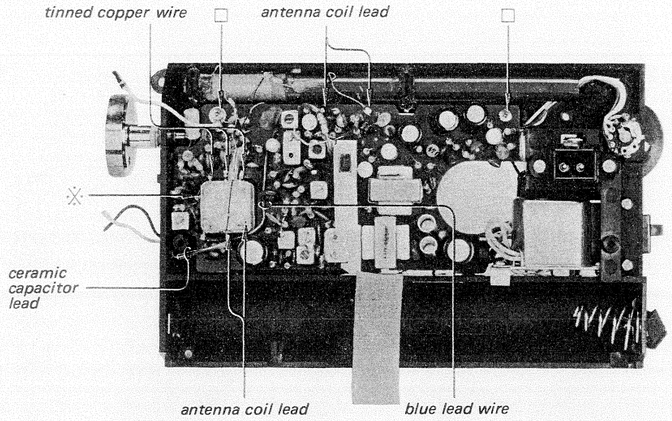


Fig. 5-1 Printed circuit board removal

1. Remove four screws marked with □ in Fig. 5-1 and Fig. 5-2.
2. Unsolder four antenna coil leads and a pvc lead wire at tuning capacitor shown in Fig. 5-1.
3. Unsolder a tuning capacitor terminal marked with ※ and three tinned copper wires shown in Fig. 5-1.
4. Unsolder a ceramic capacitor lead shown in Fig. 5-1.

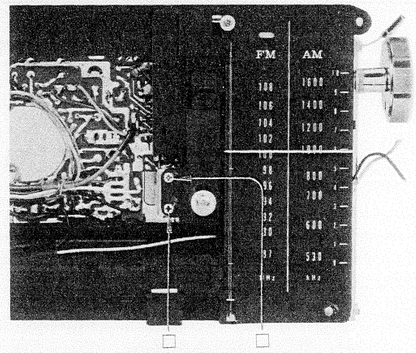


Fig. 5-2 Printed circuit board removal

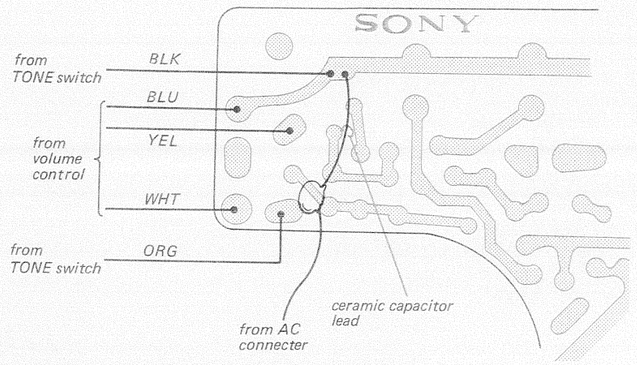


Fig. 5-3 Printed circuit board removal

5. Unsolder three pvc lead wires coming from volume control shown in Fig. 5-3.
6. Unsolder two pvc lead wires coming from TONE switch shown in Fig. 5-3.
7. Unsolder a ceramic capacitor lead coming from AC connector shown in Fig. 5-3.
8. Remove the printed circuit board.

REAR CABINET REMOVAL

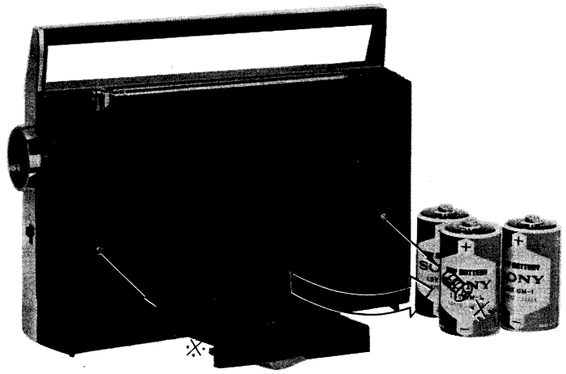


Fig. 3 Rear cabinet removal

1. Open a battery lid and take out batteries.
2. Remove rear cabinet by removing two holding screws marked with ※ in Fig. 3.
3. Pull out the ant. terminal pin from telescopic ant. terminal piece.

CHASSIS REMOVAL

Fig. 4-1 Chassis removal

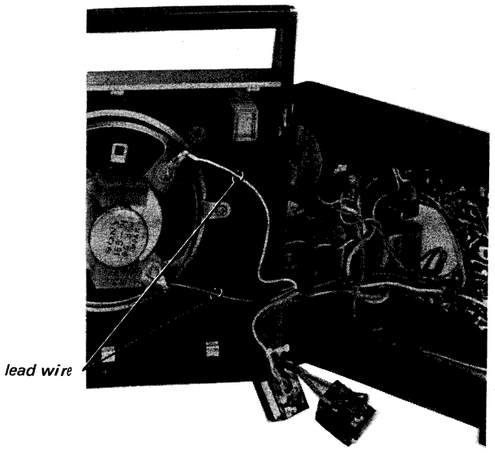


Fig. 4-2 Chassis removal

1. Remove four screws marked with △ in Fig. 4-1.
2. Unsolder two TONE switch lead wires marked with ※ in Fig. 4-1.
3. Remove chassis in the direction shown by the arrow.
4. Unsolder two speaker lead wires shown in Fig. 4-2.

PRINTED CIRCUIT BOARD REMOVAL

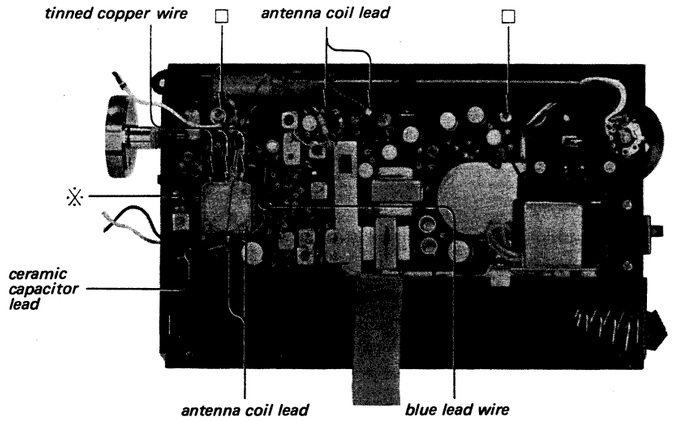


Fig. 5-1 Printed circuit board removal

1. Remove four screws marked with □ in Fig. 5-1 and Fig. 5-2.
2. Unsolder four antenna coil leads and a pvc lead wire at tuning capacitor shown in Fig. 5-1.
3. Unsolder a tuning capacitor terminal marked with ※ and three tinned copper wires shown in Fig. 5-1.
4. Unsolder a ceramic capacitor lead shown in Fig. 5-1.

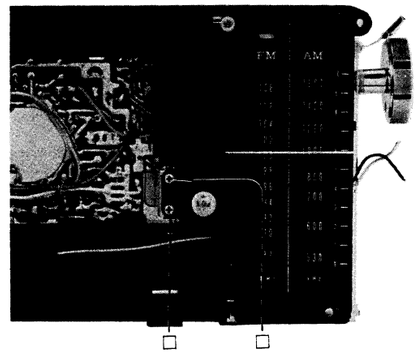


Fig. 5-2 Printed circuit board removal

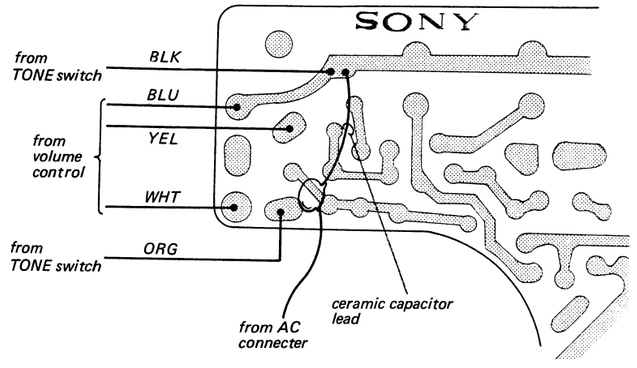


Fig. 5-3 Printed circuit board removal

5. Unsolder three pvc lead wires coming from volume control shown in Fig. 5-3.
6. Unsolder two pvc lead wires coming from TONE switch shown in Fig. 5-3.
7. Unsolder a ceramic capacitor lead coming from AC connector shown in Fig. 5-3.
8. Remove the printed circuit board.

DIAL CORD STRINGING

1. Turn tuning capacitor at fully counter-clockwise position.
2. After stringing the dial cord, attach the pointer to dial cord and set it to specified position shown in Fig. 6-1.

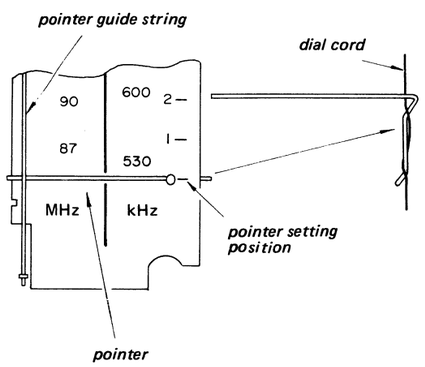


Fig. 6-1 Pointer setting

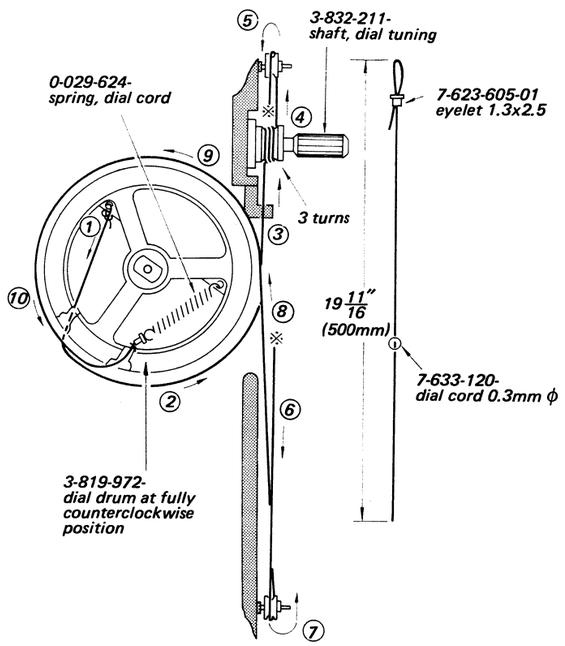


Fig. 6-2 Dial cord stringing

FM IF ALIGNMENT

Sweep Generator Connection	Sweep Generator Frequency	Oscilloscope Connection	Adjust	Remarks
See Fig.7-3.	10.7 MHz sweep width: approx. 500 kHz	MPX OUT jack	IFT F101 IFT F001 IFT F002 IFT F003 IFT F004 See Fig.7-5.	band selector ..... FM Adjust to obtain the maximum amplitude and standard "S" curve shown in Fig. 7-2.

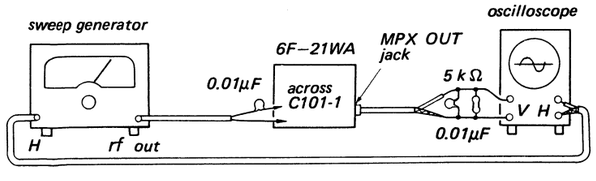


Fig. 7-1 Fm i-f alignment setup

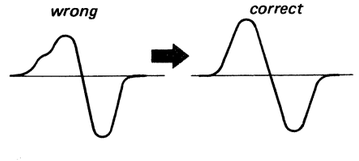


Fig. 7-2 Discriminator response "S" curve

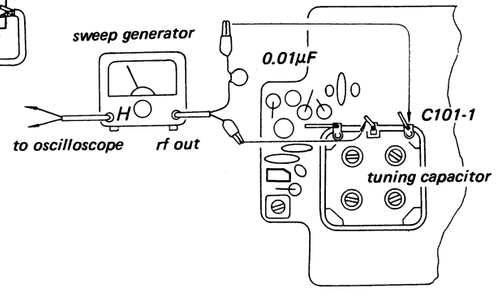


Fig. 7-3 Sweep generator connection

FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Adjusting Item	RF Signal Generator Coupling	RF Signal Generator Frequency	Receiver Dial Setting	VTVM Connection	Adjust	Remarks
FM Frequency Coverage	Connect RF Signal Generator to ant. terminal pin directly.	86 MHz (400 Hz 22.5 kHz fm)	fully downward	to earphone jack with 8 Ω load resistor in parallel	fm osc. coil L104	volume control ..... max. TONE switch ..... H AFC switch ..... OFF band selector ..... FM Adjust for maximum meter reading.
		109.5 MHz (400 Hz 22.5 kHz fm)	fully upward		fm osc. trimmer CT101-2	
FM Tracking	– ditto –	86 MHz (400 Hz 22.5 kHz fm)	tune to 86 MHz signal	– ditto –	fm rf coil L102	
		109.5 MHz (400 Hz 22.5 kHz fm)	tune to 109.5 MHz signal		fm rf trimmer CT101-1	
AM Frequency Coverage	loop antenna See Fig. 7-4.	520 kHz (1,000Hz 30% a-m)	fully downward	– ditto –	a-m osc. coil L002	Same as above except specified. band selector ..... AM
		1,680 kHz (1,000 Hz 30% a-m)	fully upward		a-m osc. trimmer CT001-2	
AM Tracking	– ditto –	620 kHz (1,000 Hz 30% a-m)	tune to 620 kHz signal	– ditto –	a-m ant coil L001	
		1,400 kHz (1,000 Hz 30% a-m)	tune to 1,400 kHz signal		a-m ant. trimmer CT001-1	

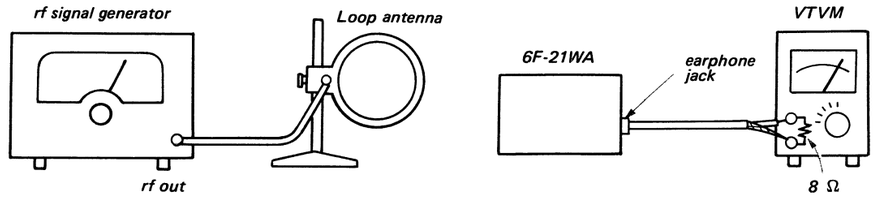


Fig. 7-4 A-m frequency coverage and tracking adjustment

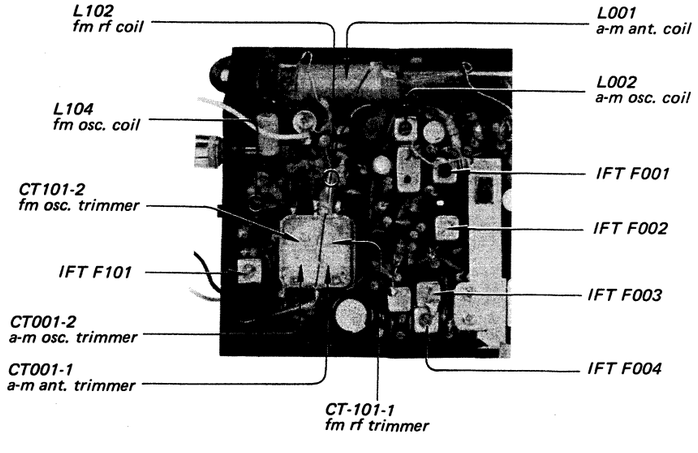
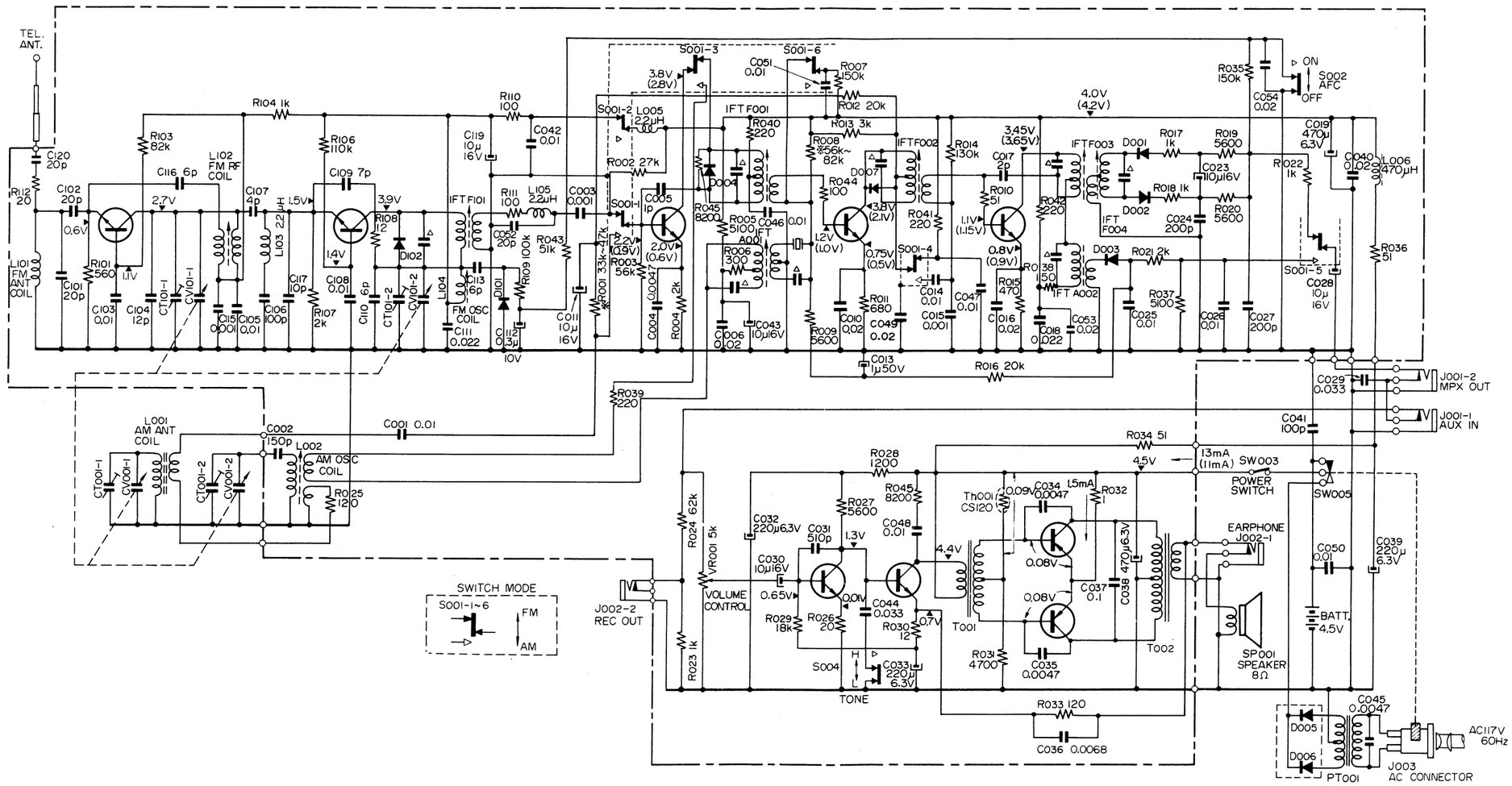


Fig. 7-5 Adjusting parts location

SCHEMATIC DIAGRAM

Q101 2SC710 (FM RF AMP)
Q102 2SC629 (FM CONV)
Q001 2SC710 (FM IF AMP1 / AM CONV)
Q002 2SC710 (FM IF AMP2 / AM IF AMP1)
Q003 2SC710 (FM IF AMP3 / AM IF AMP2)

D102 1T261 D101 1S351M D004 1T261 D007 1T261 D003 1T23 D001,D002 1T261



Q004 2SC870 (AF AMP1) Q005 2SC870 (AF AMP2) Q006,Q007 2SB495 (POWER AMP)

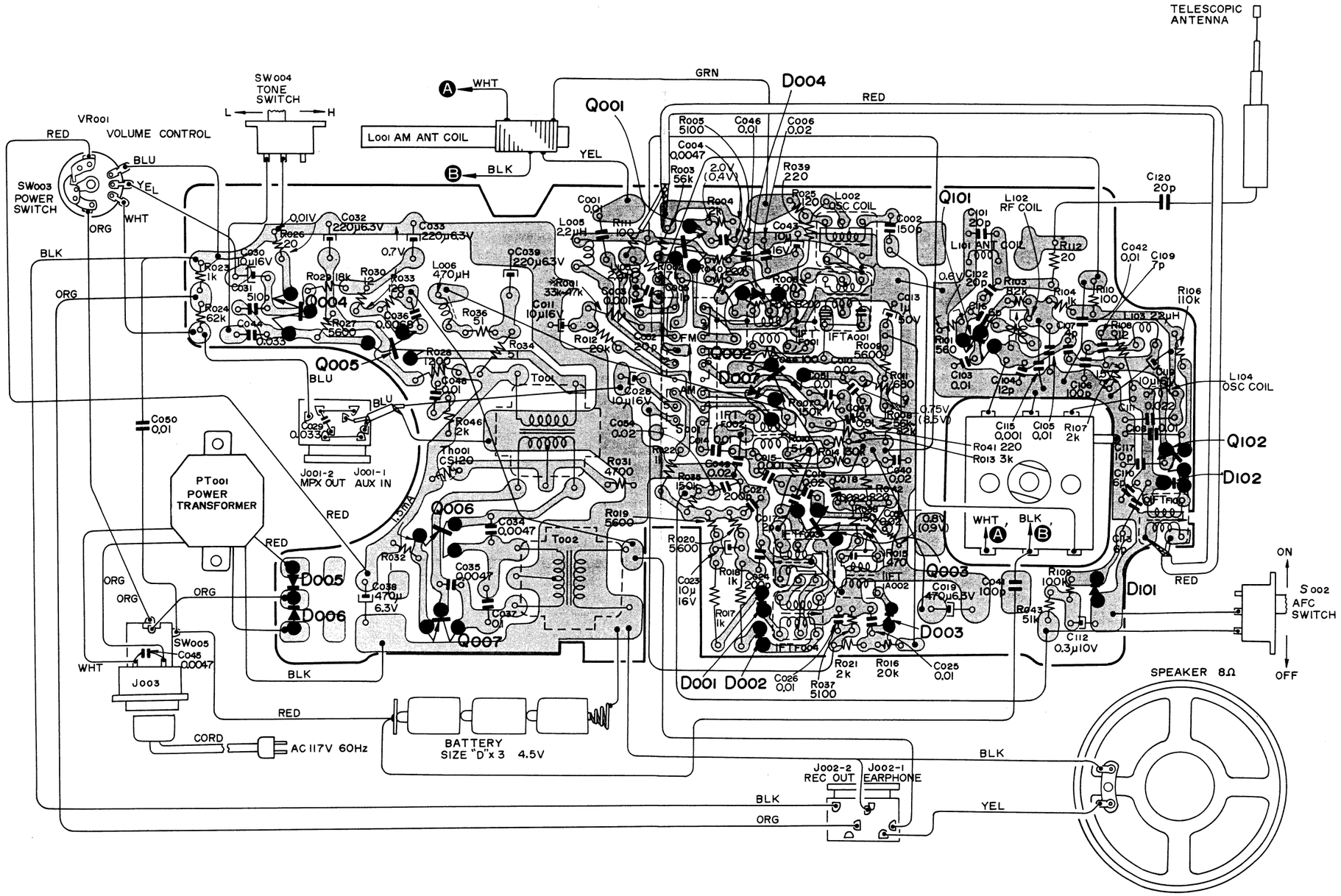
D005, D006 CD2

Note:

1. All resistors and capacitors are in Ω and μF, unless otherwise indicated.
2. Capacitor marked with △ is built in i-f transformer and ceramic filter.
3. Resistor marked with ※ is to be selected in value.
4. Voltage value is measured to ground circuit with a dc voltmeter (20 kΩ/V) and current value is measured with a dc ammeter. Voltage and current values are taken with no radio signal received and the values shown in ( ) are taken with band selector set to AM. Variations may be noted due to normal production tolerances.

MOUNTING DIAGRAM

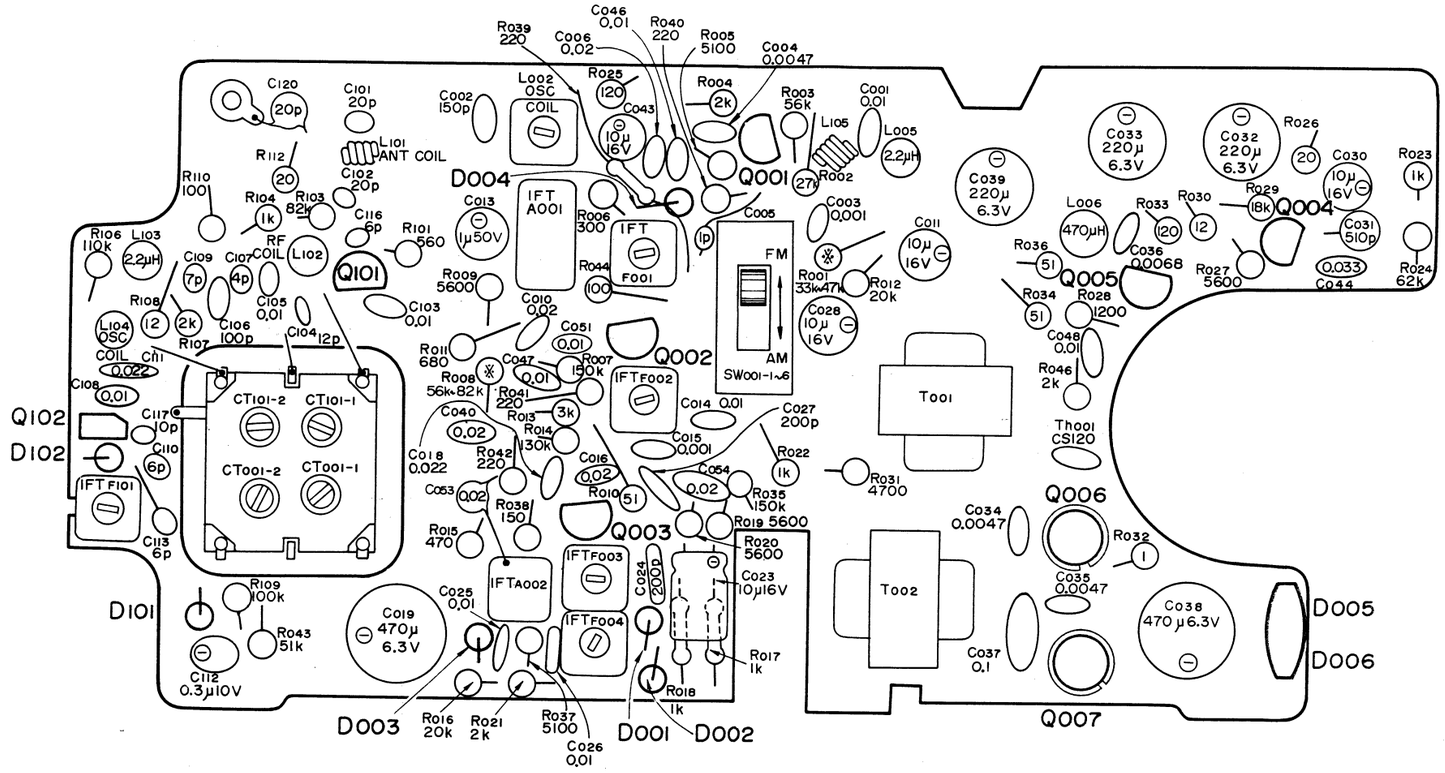
— Conductor Side —



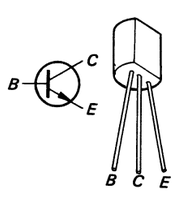
C017, C042, C049, C052, C115, C119,
R045, R111, D007: Mounted on the conductor side.
Resistor marked with ※ is to be selected in value.

Printed Circuit Board
Part No. 1-539-193-12

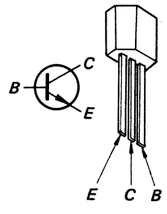
MOUNTING DIAGRAM
— Component Side —



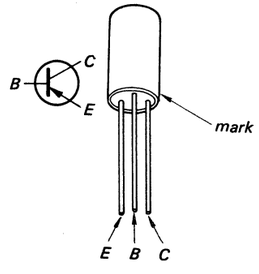
Q101 2SC710
Q001 2SC710
Q002 2SC710
Q003 2SC710
Q004 2SC710
Q005 2SC710



Q102 2SC629



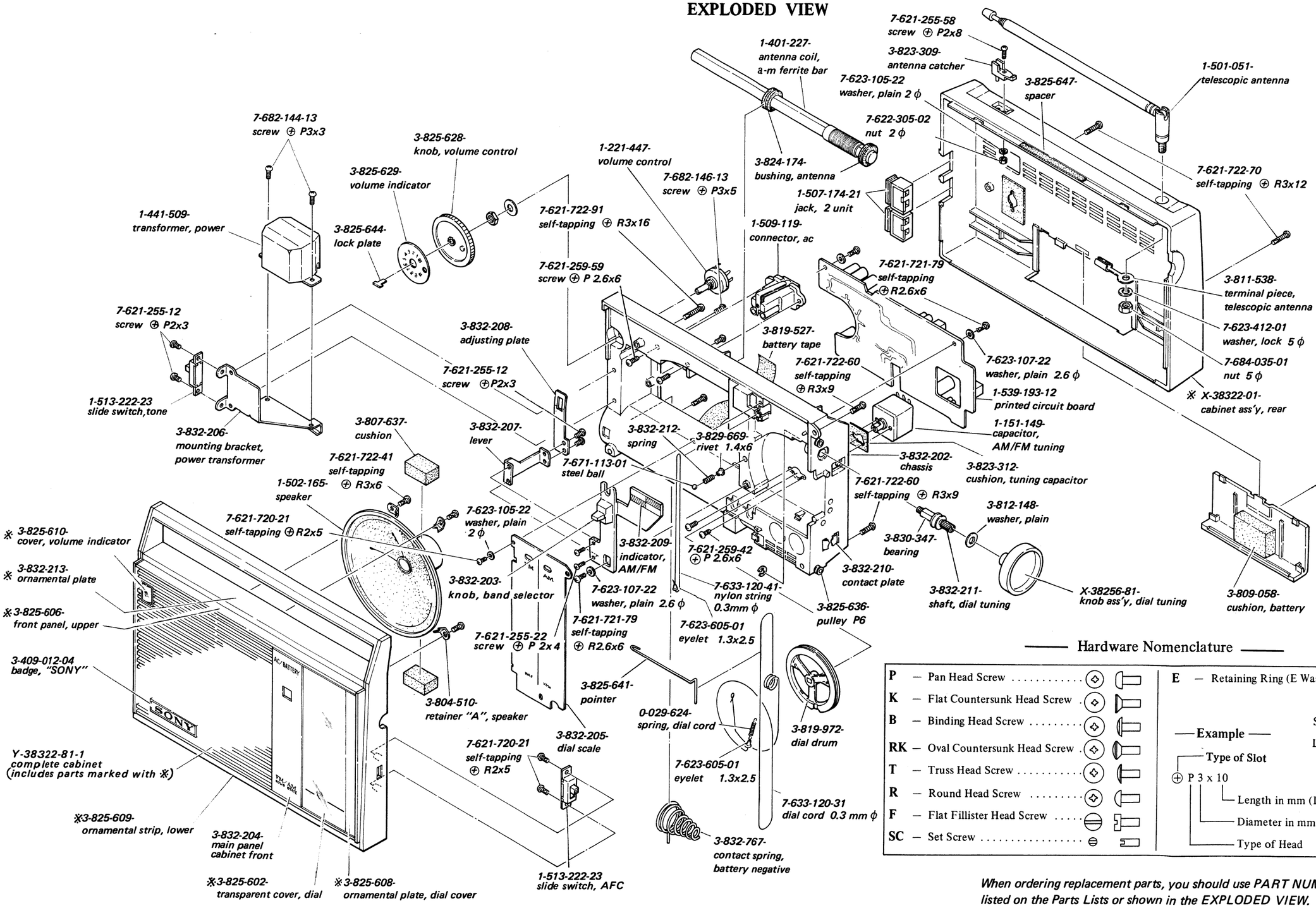
Q006 2SB495
Q007 2SB495



C017, C042, C049, C052, C115, C119,
R045, R111, D007: Mounted on the conductor side.
Resistor marked with ※ is to be selected in value.

Printed Circuit Board
Part No. 1-539-193-12

EXPLODED VIEW



Hardware Nomenclature

P	— Pan Head Screw	E	— Retaining Ring (E Washer)
K	— Flat Countersunk Head Screw	W	— Washer
B	— Binding Head Screw	SW	— Spring Washer
RK	— Oval Countersunk Head Screw	LW	— Lock Washer
T	— Truss Head Screw	N	— Nut
R	— Round Head Screw		
F	— Flat Fillister Head Screw		
SC	— Set Screw		

Example

⊕ P 3 x 10
- Type of Slot
- Length in mm (L)
- Diameter in mm (D)
- Type of Head

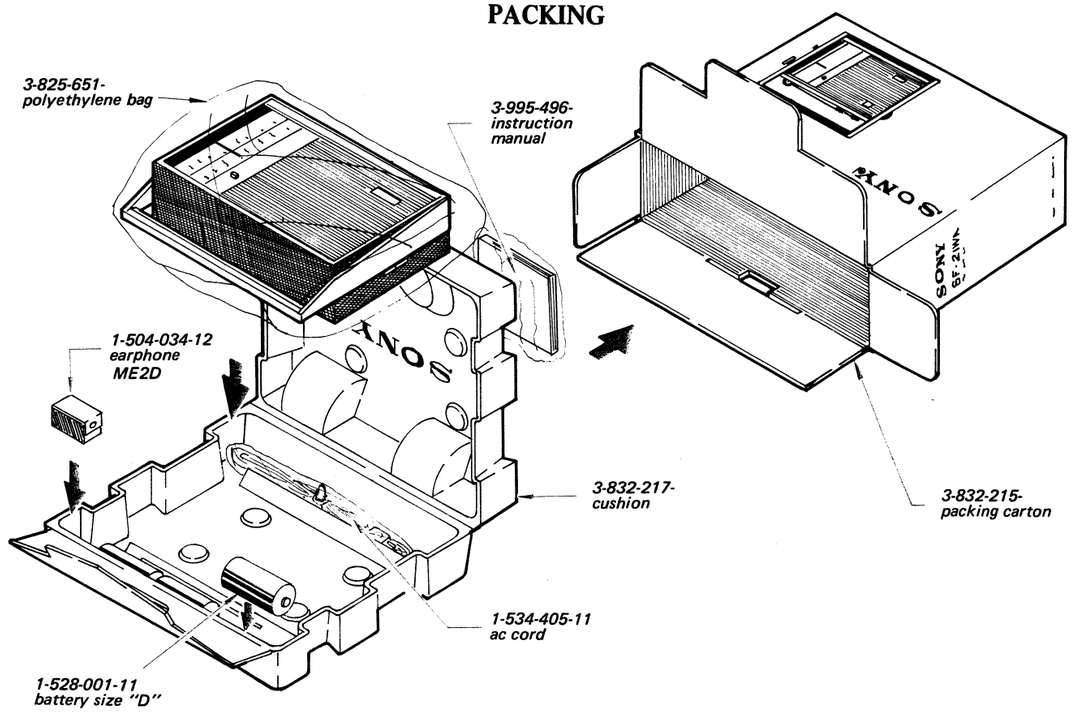
When ordering replacement parts, you should use PART NUMBER listed on the Parts Lists or shown in the EXPLODED VIEW. The symbol number should not be used for ordering purposes.

ELECTRICAL PARTS LIST

Symbol No.	Part No.	Description
		Semiconductors
Q001		transistor 2SC710
Q002		transistor 2SC710
Q003		transistor 2SC710
Q004		transistor 2SC870
Q005		transistor 2SC870
Q006		transistor 2SB495
Q007		transistor 2SB495
Q101		transistor 2SC710
Q102		transistor 2SC629
D001		diode 1T261
D002		diode 1T261
D003		diode 1T23
D004		diode 1T261
D005		diode CD-2
D006		diode CD-2
D101		diode 1S351M
D102		diode 1T261
Th001	8-691-001-11	thermistor CS120
		Coil and Transformer
L001	1-401-227-	ant. coil, a-m ferrite bar
L002	1-405-306-	osc. coil, a-m
L003		--- discarded ---
L004		--- discarded ---
L005	1-407-182-	micro inductor 2.2 μH
L006	1-407-1580-	micro inductor 470 μH
L101	1-401-228-	ant. coil, fm
L102	1-425-373-	rf coil, fm
L103	1-407-182-	micro inductor 2.2 μH
L104	1-425-533-	osc. coil, fm
L105	1-401-219-	loading coil
IFT F001	1-403-243-15	transformer, fm i-f
IFT F002	1-403-244-15	transformer, fm i-f
IFT F003	1-403-272-15	discriminator, prim.
IFT F004	1-403-273-15	discriminator,sec.
IFT A001	1-403-163-21	transformer, a-m i-f
IFT A002	1-403-137-	transformer, a-m i-f
IFT F101	1-403-242-15	transformer, fm i-f
T001	1-423-077-	transformer, driver
T002	1-427-128-	transformer, output
PT001	1-441-509-	transformer, power
		General
	1-539-193-12	printed circuit board
CV101	1-151-149-	capacitor, fm/a-m tuning
SW001	1-513-274-	slide switch, band selector
RV001	1-221-447-15	volume control
TEL ANT	1-501-051-	antenna, telescopic
SP	1-502-165-21	speaker
	1-506-108-	terminal pin, antenna
J003	1-509-119-11	connector, ac
J001	1-507-174-22	jack, 2-unit AUX IN, MPX OUT
J002	1-507-174-22	jack, 2-unit record out, earphone
J003	1-509-119-11	connector, ac
SW002	1-513-222-23	slide switch, AFC ON/OFF
SW004	1-513-222-23	slide switch, TONE
	1-534-405-	ac cord
		Resistor (carbon)
※R001	1-244-707-	27 kΩ ± 5% 1/4W
	1-244-708-	30 kΩ ± 5% 1/4W
	1-244-709-	33 kΩ ± 5% 1/4W
	1-244-710-	36 kΩ ± 5% 1/4W
	1-244-711-	39 kΩ ± 5% 1/4W
R002	1-244-707-	27 kΩ ± 5% 1/4W
R003	1-244-715-	56 kΩ ± 10% 1/4W
R004	1-244-680-	2 kΩ ± 5% 1/4W
R005	1-244-690-	5100 Ω ± 5% 1/4W
R006	1-244-660-	300 Ω ± 10% 1/4W
R007	1-244-725-	150 kΩ ± 10% 1/4W
	1-244-715-	56 kΩ ± 5% 1/4W
	1-244-716-	62 kΩ ± 5% 1/4W
※R008	1-244-717-	68 kΩ ± 5% 1/4W
	1-244-718-	75 kΩ ± 5% 1/4W
	1-244-719-	82 kΩ ± 5% 1/4W
R009	1-244-691-	5600 Ω ± 5% 1/4W
R010	1-244-642-	51 Ω ± 10% 1/4W
R011	1-244-669-	680 Ω ± 10% 1/4W
R012	1-244-704-	20 kΩ ± 5% 1/4W
R013	1-244-684-	3 kΩ ± 5% 1/4W
R014	1-244-724-	130 kΩ ± 10% 1/4W
R015	1-244-665	470 Ω ± 10% 1/4W
R016	1-244-704-	20 kΩ ± 5% 1/4W
R017	1-244-673-	1 kΩ ± 5% 1/4W
R018	1-244-673-	1 kΩ ± 5% 1/4W
R019	1-244-691-	5600 Ω ± 5% 1/4W
R020	1-244-691-	5600 Ω ± 5% 1/4W
R021	1-244-680-	2 kΩ ± 5% 1/4W
R022	1-244-673-	1 kΩ ± 5% 1/4W
R023	1-244-673-	1 kΩ ± 5% 1/4W
R024	1-244-716-	62 kΩ ± 10% 1/4W
R025	1-244-651-	120 Ω ± 10% 1/4W
R026	1-244-632-	20 Ω ± 10% 1/4W
R027	1-244-691-	5600 Ω ± 10% 1/4W
R028	1-244-675-	1200 Ω ± 10% 1/4W
R029	1-244-603-	18 kΩ ± 5% 1/4W
R030	1-244-627-	12 Ω ± 10% 1/4W
R031	1-244-685-	3300 Ω ± 5% 1/4W
R032	1-244-601-	1 Ω ± 5% 1/4W
R033	1-244-651-	120 Ω ± 10% 1/4W
R034	1-244-642-	51 Ω ± 10% 1/4W
R035	1-244-725-	150 kΩ ± 10% 1/4W
R036	1-244-642-	51 Ω ± 10% 1/4W
R037	1-244-690-	5100 Ω ± 10% 1/4W
R038	1-244-653-	150 Ω ± 10% 1/4W
R039	1-244-657-	220 Ω ± 10% 1/4W
R040	1-244-657-	220 Ω ± 10% 1/4W
R041	1-244-657-	220 Ω ± 10% 1/4W
R042	1-244-657-	220 Ω ± 10% 1/4W
R043	1-244-714-	51 kΩ ± 10% 1/4W
R044	1-244-649-	100 Ω ± 10% 1/4W
R045	1-244-695-	8200 Ω ± 5% 1/4W
R101	1-244-667-	560 Ω ± 10% 1/4W
R102		--- discarded ---
R103	1-244-719-	82 kΩ ± 5% 1/4W
R104	1-244-673-	1 kΩ ± 10% 1/4W
R105		--- discarded ---
R106	1-244-722-	110 kΩ ± 5% 1/4W
R107	1-244-680-	2 kΩ ± 5% 1/4W
R108	1-244-627-	12 Ω ± 5% 1/4W
R109	1-244-721-	100 kΩ ± 10% 1/4W
R110	1-244-649-	100 Ω ± 10% 1/4W
R111	1-244-649-	100 Ω ± 10% 1/4W
R112	1-244-632-	20 Ω ± 5% 1/4W
		Capacitor
C001	1-101-072-	0.01 μF 25 V ceramic
C002	1-107-135-	150 pF 50 V silvered mica
C003	1-101-918-	0.001 μF 50 V ceramic
C004	1-105-829-12	0.0047 μF 50 V mylar
C005	1-101-951-	1 pF 50 V ceramic
C006	1-101-073-	0.02 μF 25 V ceramic
C007		built-in i-f transformer
C008		built-in i-f transformer
C009		built-in i-f transformer
C010	1-101-073-	0.02 μF 25 V ceramic
C011	1-121-347-	10 μF 16 V electrolytic
C012		--- discarded ---
C013	1-121-347-	10 μF 16 V electrolytic
C014	1-101-072-	0.01 μF 25 V ceramic
C015	1-103-665-	390 pF 50 V styrol
C016	1-101-073-	0.02 μF 25 V ceramic
C017	1-101-952-	2 pF 50 V ceramic
C018	1-105-837-12	0.022 μF 50 V mylar
C019	1-121-342-	470 μF 6.3 V electrolytic
C020		built-in i-f transformer
C021		built-in i-f transformer
C022		built-in i-f transformer
C023	1-121-347-	10 μF 16 V electrolytic
C024	1-107-138-	200 pF 50 V silvered mica
C025	1-105-833-12	0.01 μF 35 V mylar
C026	1-105-821-12	0.001 μF 50 V mylar
C027	1-107-138-	200 pF 50 V silvered mica
C028	1-121-347-	10 μF 16 V electrolytic
C029	1-105-414-12	0.033 μF 50 V mylar
C030	1-121-347-	10 μF 16 V electrolytic
C031	1-103-668-	510 pF 50 V styrol
C032	1-121-295-	220 μF 6.3 V electrolytic
C033	1-121-295-	220 μF 6.3 V electrolytic
C034	1-105-829-12	0.0047 μF 50 V mylar
C035	1-105-829-12	0.0047 μF 50 V mylar
C036	1-105-831-12	0.0068 μF 50 V mylar
C037	1-105-417-12	0.1 μF 35 V mylar
C038	1-121-342-	470 μF 6.3 V electrolytic
C039	1-121-347-	10 μF 16 V electrolytic
C040	1-101-073-	0.02 μF 25 V ceramic
C041		--- descarded ---
C042	1-101-072-	0.01 μF 25 V ceramic
C043	1-121-342-	220 μF 6.3 V electrolytic
C044	1-105-414-12	0.033 μF 50 V mylar
C045	1-115-071-	0.0047 μF 600 V metalized paper
C046	1-101-072-	0.01 μF 25 V ceramic
C047	1-101-072-	0.01 μF 25 V ceramic
C048	1-105-833-12	0.01 μF 35 V mylar
C049	1-101-073-	0.02 μF 25 V ceramic
C050	1-101-072-	0.01 μF 25 V ceramic
C051	1-101-072-	0.01 μF 25 V ceramic
C052	1-101-864-	200 pF 50 V ceramic
C053	1-101-073-	0.02 μF 25 V ceramic
C054	1-101-073-	0.02 μF 25 V ceramic
C101	1-101-864-	20 pF 50 V ceramic
C102	1-101-864-	20 pF 50 V ceramic
C103	1-101-072-	0.01 μF 25 V ceramic
C104	1-101-961-	12 pF 50 V ceramic
C105	1-101-072-	0.01 μF 25 V ceramic
C106	1-101-896-	100 pF 50 V ceramic
C107	1-101-954-	4 pF 50 V ceramic
C108	1-101-072-	0.01 μF 25 V ceramic
C109	1-101-957-	7 pF 50 V ceramic
C110	1-101-956-	6 pF 50 V ceramic
C111	1-105-837-12	0.022 μF 50 V mylar
C112	1-127-021-	0.3 μF 10 V alminum solid
C113	1-101-956-	6 pF 50 V ceramic
C114		built-in i-f transformer
C115	1-101-918-	0.001 μF 25 V ceramic
C116	1-101-956-	6 pF 50 V ceramic
C117	1-101-965-	10 pF 50 V ceramic
C118		--- discarded ---
C119	1-121-347-	10 μF 16 V electrolytic
C120	1-101-864-	20 pF 50 V ceramic

Note: Resistor marked with ※ is to be selected in value.

PACKING



SONY CORPORATION

9H0529-1

Printed in Japan

SONY®

6F-21L

SERVICE MANUAL SUPPLEMENT

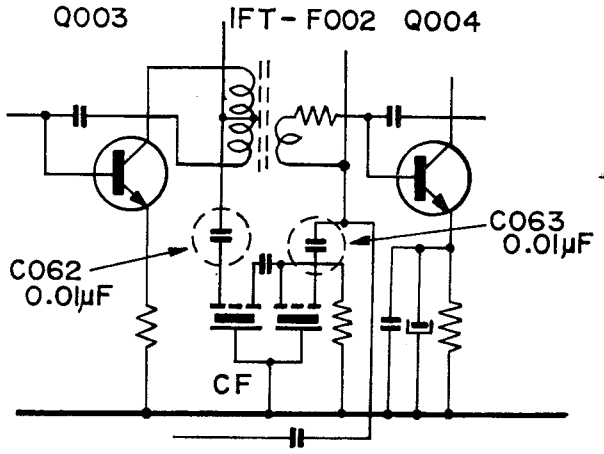
NO 1.
JUN. '69

Applicable Serial No: 17,001 and later

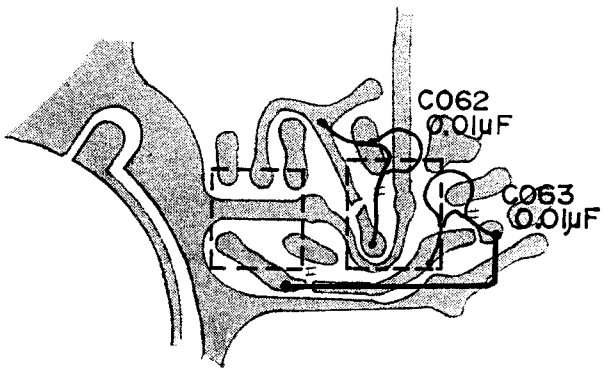
Subject: Minor change of Model 6F-21L

1. Addition of Capacitors C062 and C063

Ceramic capacitors C062 and C063 are added to prevent the ceramic filter from dc current leakage.



Schematic diagram



Mounting diagram (conductor side)
IF-AF circuit board

Note:

1. Three portions of the conductor marked with # are cut.
2. C062 and C063 are mounted on the conductor side.

Parts added: Ceramic capacitor 0.01 μF 1-101-141.....2 pcs.

2. Change of Ceramic Filter

The ceramic filter and its coupling capacitor C020 are changed.

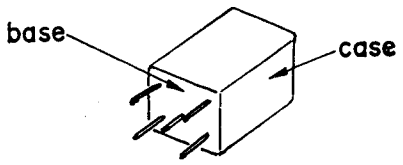
Parts changed:

Description	Former	New
Ceramic filter	1-403-161-11	1-403-161-12 or 1-403-153-13
Ceramic capaciter C 020	68 pF 1-101-888-	56 pF 1-101-884-

Note: Color identification of ceramic filter

1-403-161- case: black
base: red or black

1-403-153- case: red
base: black



Ceramic Filter

3. Change of Power Transistors

Power transistors Q007 and Q008, their heat-sinks and the base biasing resistor R 035 are changed.

Parts changed:

Description	Former	New
Transistor Q007, Q008	2SB383	2SB495
Resistor R035	3.3 kΩ 1/4 W 1-244-685-	5.1 kΩ 1/4 W 1-244-690-
Heat-Sink	3-822-634-02	3-824-751-01

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